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SET PLU ON

L1	37870	S	204/CLAS
L2	1	S	COVALENT(2A)NETWORK(2A)SOLID
L3	1022	S	IONIC(2A)SOLID
L4	607	S	MOLECULAR(2A)SOLIDS
L5	20576	S	INORGANIC(2A)MATERIALS
L6	290	S	INTERMETALLIC(2A)MATERIALS
L7	40914	S	METAL(2A)ALLOY
L8	46539	S	CERAMIC(2A)MATERIAL
L9	53666	S	ORGANIC(2A)MATERIAL
L10	486	S	ORGANOMETALLIC(2A)MATERIAL
L11	3	S	NONBIOLOGICAL(2A)ORGANIC(2A)POLYMER
L12	32294	S	COMPOSITE(2A)MATERIAL
L13	226	S	PARALLEL(2A)SYNTHESIS
L14	9	S	L1 AND L13
L15	0	S	L1 AND L2
L16	146	S	L1 AND L3
L17	8	S	L1 AND L4
L18	384	S	L1 AND L5
L19	10	S	L1 AND L6
L20	2222	S	L1 AND L7
L21	1590	S	L1 AND L8
L22	1446	S	L1 AND L9
L23	8	S	L1 AND L10
L24	0	S	L1 AND L11
L25	591	S	L1 AND L12
L26	22	S	L20 AND L21 AND L22
L27	2	S	L26 AND L16
L28	1	S	L13 AND (L2 OR L3 OR L4)



1. 5,840,256, Nov. 24, 1998, Plate for reaction system; Robert Richard Demers, et al., 422/102; **204/600**; 356/246; 422/82.05, 101, 104; 436/809 [IMAGE AVAILABLE]

US PAT NO: 5,840,256 [IMAGE AVAILABLE]

L14: 1 of 9

ABSTRACT:

The invention provides a plate having a plurality uniformly sized reaction cells formed in its upper surface, wherein the density of the reaction cells is at least about 10 cells per cm.<sup>sup.2</sup>. Preferably, the area of each of the openings of the reaction cells is no more than about 55% of the area defined by the multiplication product of (1) the pitch between reaction cells in separate rows and (2) the pitch between reaction cells in separate columns.

2. 5,837,859, Nov. 17, 1998, Preparation of a electronically conductive polymer/nucleotide copolymer; Robert Teoule, et al., 536/25.3; **204/165**; 205/158 [IMAGE AVAILABLE]

US PAT NO: 5,837,859 [IMAGE AVAILABLE]

L14: 2 of 9

ABSTRACT:

A copolymer of general formula (I), ##STR1## wherein unit A is a monomer of an electronically conductive polymer, unit B is a nucleotide, an oligonucleotide or an analogue thereof, x, y, z are integers of 1 or higher or y is 0, and l is a covalent bond, or a spacer arm. Methods for preparing said polymer and its use, in particular for nucleic acid synthesis, sequencing and hybridization, are also disclosed.

3. 5,755,942, May 26, 1998, Partitioned microelectronic device array; Peter John Zanzucchi, et al., **204/454, 452, 601, 603**; 422/68.1, 82.05, 82.09, 100 [IMAGE AVAILABLE]

US PAT NO: 5,755,942 [IMAGE AVAILABLE]

L14: 3 of 9

ABSTRACT:

A system for processing a plurality of tests or **syntheses** in **parallel** comprising a sample channel for moving samples into a microlaboratory array of a plurality of wells connected by one or more channels for the testing or synthesis of samples, a station for housing the array and an optical system comprising at least one light source and at least one light detector for measuring the samples in the array, and a means of electrically connecting said array to an apparatus capable of monitoring and controlling the flow of fluids into the array. Samples are loaded from a common loading channel into the array, processed in the wells and measurements taken by the optical system. The array can process many samples, or synthesize many compounds in parallel, reducing the time required for such processes.

4. 5,667,667, Sep. 16, 1997, Electrochemical treatment of surfaces; Edwin Southern, 205/687; **204/267, 412**; 205/688, 698, 699, 766 [IMAGE AVAILABLE]

US PAT NO: 5,667,667 [IMAGE AVAILABLE]

L14: 4 of 9

ABSTRACT:

A method of electrochemically patterning a surface comprises providing an

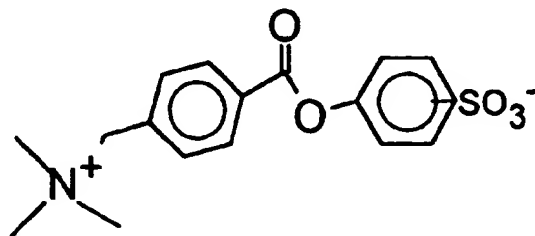
Typically, cationic peroxyacid precursors are formed by substituting the peroxyacid part of a suitable peroxyacid precursor compound with a positively charged functional group, such as an ammonium or alkyl ammonium group, preferably an ethyl or methyl ammonium group. Cationic peroxyacid precursors are typically present in the compositions as a salt with a suitable anion, such as for example a halide ion or a methylsulfate ion.

The peroxyacid precursor compound to be so cationically substituted may be a perbenzoic acid, or substituted derivative thereof, precursor compound as described hereinbefore. Alternatively, the peroxyacid precursor compound may be an alkyl percarboxylic acid precursor compound or an amide substituted alkyl peroxyacid precursor as described hereinafter

Cationic peroxyacid precursors are described in U.S. Patents 4,904,406; 4,751,015; 4,988,451; 4,397,757; 5,269,962; 5,127,852; 5,093,022; 5,106,528; U.K. 1,382,594; EP 475,512, 458,396 and 284,292; and in JP 87-318,332.

Suitable cationic peroxyacid precursors include any of the ammonium or alkyl ammonium substituted alkyl or benzoyl oxybenzene sulfonates, N-acylated caprolactams, and monobenzoyltetraacetyl glucose benzoyl peroxides.

A preferred cationically substituted benzoyl oxybenzene sulfonate is the 4-(trimethyl ammonium) methyl derivative of benzoyl oxybenzene sulfonate:



A preferred cationically substituted alkyl oxybenzene sulfonate has the formula:

electrolyte overlying the surface and an array of electrodes adjacent the surface and in contact with the electrolyte, and altering the potential of one or more electrodes of the array so as to deposit or remove or chemically modify a substance on the surface adjacent the electrode. Several such treatments can be performed in sequence, using different electrodes of the array. The method is particularly suitable for step-wise chemical synthesis e.g. of oligonucleotides or other oligomers tethered to the surface. Electrode arrays for use in the method are also claimed.

5. 5,661,028, Aug. 26, 1997, Large scale DNA microsequencing device; Robert S. Foote, 435/287.2; **204/450, 456**; 216/39; 423/324; 435/6, 91.1; 536/24.3 [IMAGE AVAILABLE]

US PAT NO: 5,661,028 [IMAGE AVAILABLE]

L14: 5 of 9

ABSTRACT:

A microminiature sequencing apparatus and method provide means for simultaneously obtaining sequences of plural polynucleotide strands. The apparatus comprises a microchip into which plural channels have been etched using standard lithographic procedures and chemical wet etching. The channels include a reaction well and a separating section. Enclosing the channels is accomplished by bonding a transparent cover plate over the apparatus. A first oligonucleotide strand is chemically affixed to the apparatus through an alkyl chain. Subsequent nucleotides are selected by complementary base pair bonding. A target nucleotide strand is used to produce a family of labelled sequencing strands in each channel which are separated in the separating section. During or following separation the sequences are determined using appropriate detection means.

6. 5,593,838, Jan. 14, 1997, Partitioned microelectronic device array; Peter J. Zanzucchi, et al., 435/6; **204/450**; 435/287.2, 288.5 [IMAGE AVAILABLE]

US PAT NO: 5,593,838 [IMAGE AVAILABLE]

L14: 6 of 9

ABSTRACT:

A system for processing a plurality of tests or **syntheses** in **parallel** comprising a sample channel for moving samples into a microlaboratory array of a plurality of wells connected by one or more channels for the testing or synthesis of samples, a station for housing the array and an optical system comprising at least one light source and at least one light detector for measuring the samples in the array, and a means of electrically connecting said array to an apparatus capable of monitoring and controlling the flow of fluids into the array. Samples are loaded from a common loading channel into the array, processed in the wells and measurements taken by the optical system. The array can process many samples, or synthesize many compounds in parallel, reducing the time required for such processes.

7. 5,585,069, Dec. 17, 1996, Partitioned microelectronic and fluidic device array for clinical diagnostics and chemical synthesis; Peter J. Zanzucchi, et al., 422/100; **204/450, 600**; 422/58, 68.1; 436/43 [IMAGE AVAILABLE]

US PAT NO: 5,585,069 [IMAGE AVAILABLE]

L14: 7 of 9

ABSTRACT:

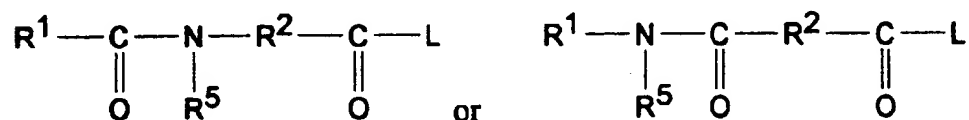
A system for processing a plurality of tests or **syntheses** in **parallel** comprising a sample channel for moving samples into a microlaboratory array of a plurality of wells connected by one or more channels for the testing or synthesis of samples, a station for housing the array and an optical system comprising at least one light source and at least one light detector for measuring the samples in the array, and a means of electrically connecting the array to an apparatus capable of

### Perbenzoic acid derivative precursors

Perbenzoic acid derivative precursors provide substituted perbenzoic acids on perhydrolysis.

Suitable substituted perbenzoic acid derivative precursors include any of the herein disclosed perbenzoic precursors in which the benzoyl group is substituted by essentially any non-positively charged (i.e.; non-cationic) functional group including, for example alkyl, hydroxy, alkoxy, halogen, amine, nitrosyl and amide groups.

A preferred class of substituted perbenzoic acid precursor compounds are the amide substituted compounds of the following general formulae:



wherein  $\text{R}^1$  is an aryl or alkaryl group with from 1 to 14 carbon atoms,  $\text{R}^2$  is an arylene, or alkarylene group containing from 1 to 14 carbon atoms, and  $\text{R}^5$  is H or an alkyl, aryl, or alkaryl group containing 1 to 10 carbon atoms and L can be essentially any leaving group.  $\text{R}^1$  preferably contains from 6 to 12 carbon atoms.  $\text{R}^2$  preferably contains from 4 to 8 carbon atoms.  $\text{R}^1$  may be aryl, substituted aryl or alkaryl containing branching, substitution, or both and may be sourced from either synthetic sources or natural sources including for example, tallow fat. Analogous structural variations are permissible for  $\text{R}^2$ . The substitution can include alkyl, aryl, halogen, nitrogen, sulphur and other typical substituent groups or organic compounds.  $\text{R}^5$  is preferably H or methyl.  $\text{R}^1$  and  $\text{R}^5$  should not contain more than 18 carbon atoms in total. Amide substituted bleach activator compounds of this type are described in EP-A-0170386.

### Cationic peroxyacid precursors

Cationic peroxyacid precursor compounds produce cationic peroxyacids on perhydrolysis.

monitoring and controlling the flow of fluids into the array. Samples are loaded from a common loading channel into the array, processed in the wells and measurements taken by the optical system. The array can process many samples, or synthesize many compounds in parallel, reducing the time required for such processes.

8. 5,419,824, May 30, 1995, Electrode, electrode manufacturing process and electrochemical cell; Oleh Weres, et al., 204/268, 242, 284, 290F [IMAGE AVAILABLE]

US PAT NO: 5,419,824 [IMAGE AVAILABLE] L14: 8 of 9

ABSTRACT:

This invention provides a novel electrode which is capable of operation at sufficiently positive anodic potential to produce hydroxyl free radicals and release them into solution, and a process for producing these electrodes. It also provides electrochemical cells utilizing these electrodes, and a novel material included in these electrodes. The electrode consists of titanium metal or a titanium alloy, with an oxide coating that includes titanium dioxide and also includes niobium(IV) oxide or tantalum(IV) oxide, sufficient to impart adequate electrical conductivity to the titanium dioxide under the necessary anodic polarization. An electrode preparation process is described, which allows niobium or tantalum in the oxide coating to be reduced to the +4 valence state, and causes the coating to assume a very stable and insoluble crystal structure. A process for manufacturing ammonium niobate, which is the preferred source compound for niobium in the electrode manufacturing process, is also provided.

9. 5,318,679, Jun. 7, 1994, Synthesis of chain chemical compounds; Gary M. Nishioka, 204/157.68, 157.61; 436/518 [IMAGE AVAILABLE]

US PAT NO: 5,318,679 [IMAGE AVAILABLE] L14: 9 of 9

ABSTRACT:

The present invention is an improved method of making sequenced chemical chain compounds through the application of laser copy technology to UV light directed spatially addressed **parallel chemical synthesis** and is particularly useful in the production of numerous proteins of varying amino acid sequences on a restricted solid support. Chemical groups, such as amines, are attached to the surface of a solid support, such as flat glass, and subjected to chemical reaction disposed to link chemical units to the attached groups that are protected from further reaction by photolabile groups. Such solid support and photolabile protected units are then selectively deprotected by irradiation with a UV laser beam. The support and attached units are then subjected to chemical reaction to link chemical units to the selectively deprotected units. By repeated such treatment it is possible to produce unlimited combinations of chain chemical units in less time and at greater efficiency than has previously been possible.

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1. 5,776,359, Jul. 7, 1998, Giant magnetoresistive cobalt oxide compounds; Peter G. Schultz, et al., 1/1; 423/263 [IMAGE AVAILABLE]

US PAT NO: 5,776,359 [IMAGE AVAILABLE]

L2: 1 of 1

ABSTRACT:

Methods and apparatus for the preparation and use of a substrate having an array of diverse materials in predefined regions thereon. A substrate having an array of diverse materials thereon is generally prepared by delivering components of materials to predefined regions on a substrate, and simultaneously reacting the components to form at least two materials. Materials which can be prepared using the methods and apparatus of the present invention include, for example, **covalent network solids**, **ionic solids** and molecular solids. More particularly, materials which can be prepared using the methods and apparatus of the present invention include, for example, inorganic materials, intermetallic materials, metal alloys, ceramic materials, organic materials, organometallic materials, non-biological organic polymers, composite materials (e.g., inorganic composites, organic composites, or combinations thereof), etc. Once prepared, these materials can be screened for useful properties including, for example, electrical, thermal, mechanical, morphological, optical, magnetic, chemical, or other properties. Thus, the present invention provides methods for the parallel synthesis and analysis of novel materials having useful properties.

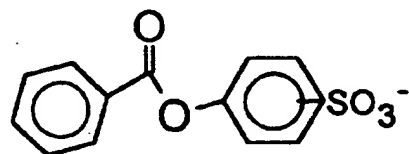
including, for example alkyl, hydroxy, alkoxy, halogen, amine, nitrosyl, amide and ammonium or alkyl ammonium groups.

The preferred solubilizing groups are  $-\text{SO}_3^- \text{M}^+$ ,  $-\text{CO}_2^- \text{M}^+$ ,  $-\text{SO}_4^- \text{M}^+$ ,  $-\text{N}^+(\text{R}^3)_4 \text{X}^-$  and  $\text{O}=\text{N}(\text{R}^3)_3$  and most preferably  $-\text{SO}_3^- \text{M}^+$  and  $-\text{CO}_2^- \text{M}^+$  wherein  $\text{R}^3$  is an alkyl chain containing from 1 to 4 carbon atoms, M is a cation which provides solubility to the bleach activator and X is an anion which provides solubility to the bleach activator. Preferably, M is an alkali metal, ammonium or substituted ammonium cation, with sodium and potassium being most preferred, and X is a halide, hydroxide, methylsulfate or acetate anion.

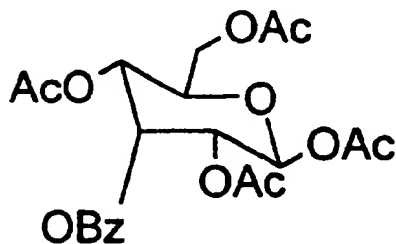
#### Perbenzoic acid precursor

Perbenzoic acid precursor compounds provide perbenzoic acid on perhydrolysis.

Suitable O-acylated perbenzoic acid precursor compounds include the substituted and unsubstituted benzoyl oxybenzene sulfonates, including for example benzoyl oxybenzene sulfonate:



Also suitable are the benzoylation products of sorbitol, glucose, and all saccharides with benzoylating agents, including for example:



1. 5,679,231, Oct. 21, 1997, Gel bed dialyzer; Donald H. Alexander, et al., 204/627; 210/321.6, 321.64, 321.87, 321.88 [IMAGE AVAILABLE]

US PAT NO: 5,679,231 [IMAGE AVAILABLE]

L17: 1 of 8

ABSTRACT:

A hemodialysis apparatus separates constituents from blood plasma utilizing layered gel membranes of differing permeabilities configured as a U-tube. Physical filter pressing of blood plasma is accomplished by pinching gel beds along the U-tube axis where localized pressure rise and centrifugal forces are established. The U-tube fold also establishes chemical countercurrent pumping across the gel beds. Capillary and electroosmotic gel filtration further accomplishes selective chemical removal and readsorption.

2. 5,393,390, Feb. 28, 1995, Treatment and recycling of overspray from the spray application of waterborne coatings; Karl-Heinz Freese, et al., 210/650; 204/553, 648; 210/195.2, 652 [IMAGE AVAILABLE]

US PAT NO: 5,393,390 [IMAGE AVAILABLE]

L17: 2 of 8

ABSTRACT:

A process and apparatus for treating overspray from the spray application of waterborne coatings is provided, which includes at least an electrophoresis separation step (means) for recovering substantially all of **solids** and higher **molecular** weight water-soluble components and a second separation step (means) for recovering the remainder. The result of such treatment is a recyclable waterborne coating stream of substantially the same composition as the waterborne coating and a recyclable water stream containing substantially none of the resin or additive parts of the original waterborne coating. The process and apparatus are effective, efficient and relatively simple, and recycling is effected without the use of coagulants, detackifiers and other chemical additives which may complicate the recycling procedure and have a detrimental effect on the so recycled products.

3. 4,525,278, Jun. 25, 1985, Method of treating chemical process water; Arthur W. Frost, III, 210/638; 162/29, 190; 204/158.2; 210/650, 651, 702, 713, 748, 805 [IMAGE AVAILABLE]

US PAT NO: 4,525,278 [IMAGE AVAILABLE]

L17: 3 of 8

ABSTRACT:

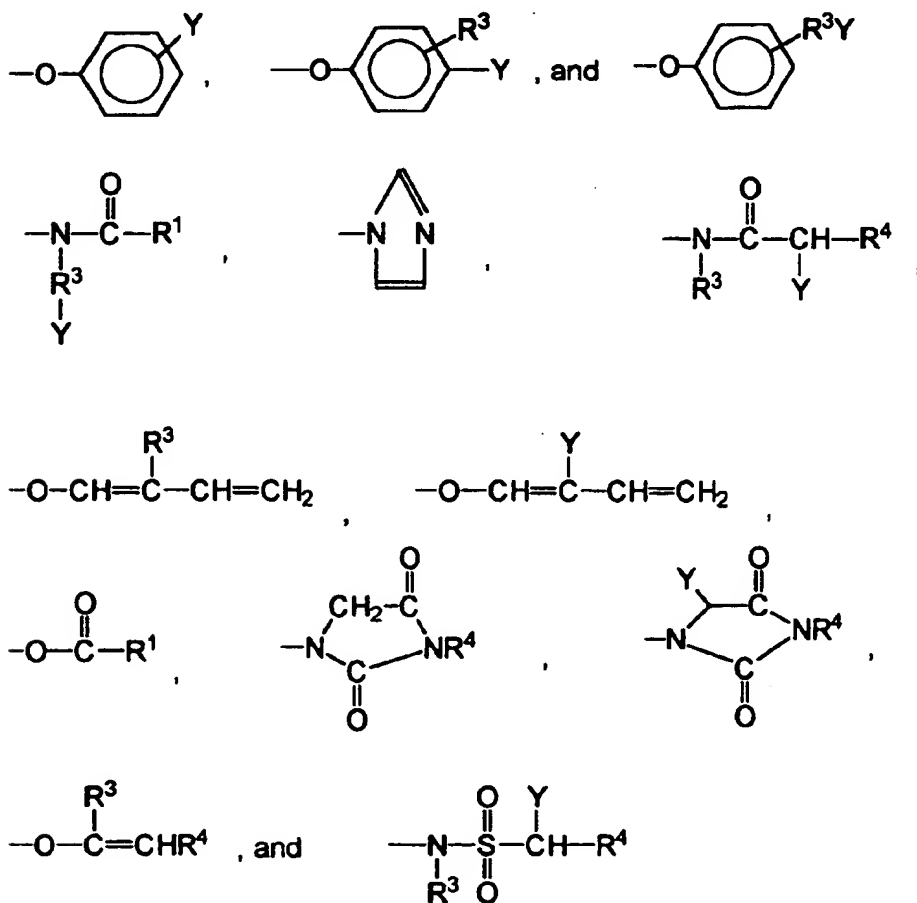
A method of treating chemical process water which contains dissolved solids, usually of a biodegradable organic nature. According to the invention, the dissolved organic solids, which are objectionable because they cause process equipment corrosion, undesirable product and process odors and pollution, are treated with ultraviolet light. The light treatment causes dissolved materials of relatively simple chemical structure to react and create more complex, less soluble materials which can easily be removed from the system as they become less soluble. The method is applicable to papermaking and numerous other industrial processes using large quantities of process water.

4. 4,321,114, Mar. 23, 1982, Electrochemical doping of conjugated polymers; Alan G. MacDiarmid, et al., 205/58; 136/263; 204/291; 205/688; 320/127, 137; 429/50, 199, 213 [IMAGE AVAILABLE]

Leaving groups

The leaving group, hereinafter L group, must be sufficiently reactive for the perhydrolysis reaction to occur within the optimum time frame (e.g., a wash cycle). However, if L is too reactive, this activator will be difficult to stabilize for use in a bleaching composition.

Preferred L groups are selected from the group consisting of:



and mixtures thereof, wherein  $R^1$  is an alkyl, aryl, or alkaryl group containing from 1 to 14 carbon atoms,  $R^3$  is an alkyl chain containing from 1 to 8 carbon atoms,  $R^4$  is H or  $R^3$ , and Y is H or a solubilizing group. Any of  $R^1$ ,  $R^3$  and  $R^4$  may be substituted by essentially any functional group

## ABSTRACT:

Conjugated polymers are doped with dopant ions to a preselected room temperature electrical conductivity ranging from that characteristic of semiconductor behavior to that characteristic of metallic behavior, by means of an electrochemical procedure wherein the polymer is employed as one or both of the electrodes of an electrolytic cell, including as the electrolyte a compound which is ionizable into the dopant ions. Upon electrolysis of the electrolyte, the polymer, if used as the anode, becomes doped with anionic dopant ions to a p-type material; or if used as the cathode, becomes doped with cationic dopant ions to an n-type material.

The above-described electrochemical doping procedure finds particularly useful application in the charging of novel secondary batteries in which a doped conjugated polymer is employed as one or both of the electrodes. Such secondary batteries, in their charged state, comprise a metal whose Pauling electronegativity value is no greater than 1.6, or a conjugated polymer doped with dopant cations of said metal, as the anode-active material; a conjugated polymer doped with dopant anions as the cathode-active material; and a compound which is ionizable into the dopant ions as the electrolyte. In the initial discharged state of such secondary batteries, the polymer is in undoped form, and charging of the battery is effected by electrochemical doping of the polymer with the dopant ions of the electrolyte.

5. 4,003,812, Jan. 18, 1977, Colloidal polysulfone electrodeposition compositions; Luciano C. Scala, et al., 428/457; **204/492**; 524/99, 233, 358, 361 [IMAGE AVAILABLE]

US PAT NO: 4,003,812 [IMAGE AVAILABLE]

L17: 5 of 8

## ABSTRACT:

A conducting, non-aqueous, colloidal, polysulfone electrodeposition composition is made by mixing: (1) 1 part polysulfone polymer and 20-37 parts non-aqueous, organic, aprotic solvent for the polysulfone polymer with (2) 0.8-1.2 parts of a nitrogen containing base, to form a polysulfone polymer solution, which is added to (3) 25-150 parts of a non-aqueous, non-solvent for the polysulfone polymer, which is miscible with the aprotic solvent.

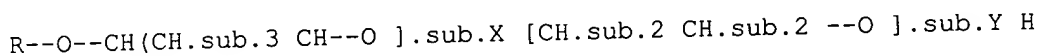
6. 3,945,964, Mar. 23, 1976, Aqueous epoxy emulsions; Garth Winton Hastings, et al., 523/406; **204/489**; 521/88, 116, 135; 523/412, 414, 423 [IMAGE AVAILABLE]

US PAT NO: 3,945,964 [IMAGE AVAILABLE]

L17: 6 of 8

## ABSTRACT:

Stable aqueous emulsions of epoxy resins containing as an emulsifying agent between 2 and 10% by weight relative to the weight of the epoxy resin of ethylene oxidepropylene oxide block polymers having the formulae



and

$\text{R--O--CH.sub.2 CH.sub.2 (CH.sub.3)--O }).sub.X [\text{CH.sub.2 CH.sub.2 --O }).sub.Y \text{ H}$   
in which X is an integer of at least 8 and at most 22, Y is an integer from at least 25 and at most 40, and R is a radical of the group consisting of alkenyl, aralkyl, cycloalkyl, aralkenyl and cycloalkenyl radicals.

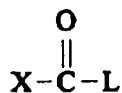
7. 3,852,180, Dec. 3, 1974, APPARATUS FOR CO CONVERSION TO METHANE;

Other coatings which contain silicate (alone or with borate salts or boric acids or other inorganics), waxes, oils, fatty soaps can also be used advantageously within the present invention.

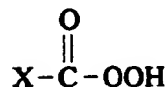
Potassium peroxymonopersulfate is another inorganic perhydrate salt of utility in the compositions herein.

#### Peroxyacid bleach precursor

Peroxyacid bleach precursors are compounds which react with hydrogen peroxide in a perhydrolysis reaction to produce a peroxyacid. Generally peroxyacid bleach precursors may be represented as



where L is a leaving group and X is essentially any functionality, such that on perhydrolysis the structure of the peroxyacid produced is



Peroxyacid bleach precursor compounds are preferably incorporated at a level of from 0.5% to 20% by weight, more preferably from 1% to 10% by weight, most preferably from 1.5% to 5% by weight of the compositions.

Suitable peroxyacid bleach precursor compounds typically contain one or more N- or O-acyl groups, which precursors can be selected from a wide range of classes. Suitable classes include anhydrides, esters, imides, lactams and acylated derivatives of imidazoles and oximes. Examples of useful materials within these classes are disclosed in GB-A-1586789. Suitable esters are disclosed in GB-A-836988, 864798, 1147871, 2143231 and EP-A-0170386.

Derek P. Gregory, 204/277, 246, 270; 518/728; 585/943 [IMAGE AVAILABLE]

US PAT NO: 3,852,180 [IMAGE AVAILABLE]

L17: 7 of 8

ABSTRACT:

A process of fixation and conversion of carbon dioxide from the atmosphere or other sources to produce methane and oxygen. Carbon dioxide is scrubbed from a CO.sub.2 -containing source and separated by process of chemical concentration. A special cell is provided in which hydrogen is produced and reacted with the separated CO.sub.2 at methanation conditions to produce methane.

8. 3,847,785, Nov. 12, 1974, ELECTROPHORESIS APARATUS; William B. Allington, 204/613 [IMAGE AVAILABLE]

US PAT NO: 3,847,785 [IMAGE AVAILABLE]

L17: 8 of 8

ABSTRACT:

To separate and collect different molecular species in a mixture of the species, the mixture is first electrophoresed in a gel such as a polyacrylamide gel to obtain good resolution of at least some of the different species and then electrophoresed into a collecting medium having bulk flow characteristics such as a density gradient column so that the different species can be scanned and collected using techniques and apparatus that require bulk flow of the medium, with further electrophoresis in the collecting medium providing further separation.

2 % to 30% by weight and most preferably from 5% to 25 / by weight of the compositions.

Examples of inorganic perhydrate salts include perborate, percarbonate, perphosphate, persulfate and persilicate salts. The inorganic perhydrate salts are normally the alkali metal salts. The inorganic perhydrate salt may be included as the crystalline solid without additional protection. For certain perhydrate salts however, the preferred executions of such granular compositions utilize a coated form of the material which provides better storage stability for the perhydrate salt in the granular product.

Sodium perborate can be in the form of the monohydrate of nominal formula  $\text{NaBO}_2\text{H}_2\text{O}_2$  or the tetrahydrate  $\text{NaBO}_2\text{H}_2\text{O}_2 \cdot 3\text{H}_2\text{O}$ .

Alkali metal percarbonates, particularly sodium percarbonate are preferred perhydrates for inclusion in compositions in accordance with the invention. Sodium percarbonate is an addition compound having a formula corresponding to  $2\text{Na}_2\text{CO}_3 \cdot 3\text{H}_2\text{O}_2$ , and is available commercially as a crystalline solid. Sodium percarbonate, being a hydrogen peroxide addition compound tends on dissolution to release the hydrogen peroxide quite rapidly which can increase the tendency for localised high bleach concentrations to arise. The percarbonate is most preferably incorporated into such compositions in a coated form which provides in-product stability.

A suitable coating material providing in product stability comprises mixed salt of a water soluble alkali metal sulphate and carbonate. Such coatings together with coating processes have previously been described in GB-1,466,799, granted to Interlox on 9th March 1977. The weight ratio of the mixed salt coating material to percarbonate lies in the range from 1 : 200 to 1 : 4, more preferably from 1 : 99 to 1 : 9, and most preferably from 1 : 49 to 1 : 19. Preferably, the mixed salt is of sodium sulphate and sodium carbonate which has the general formula  $\text{Na}_2\text{SO}_4 \cdot n \cdot \text{Na}_2\text{CO}_3$  wherein n is from 0.1 to 3, preferably n is from 0.3 to 1.0 and most preferably n is from 0.2 to 0.5.



1. 5,490,911, Feb. 13, 1996, Reactive multilayer synthesis of hard ceramic foils and films; Daniel M. Makowiecki, et al., 204/192.15, 192.16; 427/376.7, 376.8, 405 [IMAGE AVAILABLE]

US PAT NO: 5,490,911 [IMAGE AVAILABLE]

L19: 1 of 10

ABSTRACT:

A method for synthesizing hard ceramic materials such as carbides, borides and aluminides, particularly in the form of coatings provided on another material so as to improve the wear and abrasion performance of machine tools, for example. The method involves the sputter deposition of alternating layers of reactive metals with layers of carbon, boron, or aluminum and the subsequent reaction of the multilayered structure to produce a dense crystalline ceramic. The material can be coated on a substrate or formed as a foil which can be coiled as a tape for later use.

2. 5,378,500, Jan. 3, 1995, Method of making precursors and articles of ceramic-reinforced metal matrix composites; Charles M. Ward-Close, et al., 427/250; 204/192.1; 427/249, 255, 255.7, 566, 585 [IMAGE AVAILABLE]

US PAT NO: 5,378,500 [IMAGE AVAILABLE]

L19: 2 of 10

ABSTRACT:

Precursors for metal matrix composites are produced by coating a long fibre ceramic reinforcement with alternating layers of dissimilar species of matrix materials to an aggregate thickness sufficient to yield the intended matrix volume fraction in a consolidated product without additional material. This duplex coating of fibres is performed by vapor phase deposition comprising vapor condensation, sputtering or chemical vapor reaction. The precursor includes an aggregate coating of at least 5% of fibre diameter, preferably at least 20%. Various duplex systems are disclosed, each having one component significantly more frangible than the other to render damage tolerant properties to the resultant metal composite.

Product materials are produced from the duplex matrix coated fibres by consolidation of an assembly of coated fibres under conditions of elevated temperature and pressure to cause inter-fibre matrix flow and bonding of matrix materials.

3. 5,378,327, Jan. 3, 1995, Treated carbon cathodes for aluminum production, the process of making thereof and the process of using thereof; J. A. Sekhar, et al., 205/380; 204/243.1, 290R, 291, 294; 252/506; 264/105; 427/126.1, 190 [IMAGE AVAILABLE]

US PAT NO: 5,378,327 [IMAGE AVAILABLE]

L19: 3 of 10

ABSTRACT:

To improve its resistance to penetration and degradation by sodium, a carbon cathode for use in aluminium production by the electrolysis of alumina dissolved in a cryolite-based molten electrolyte is pre-treated with a solution, suspension or melt of a compound of lithium, sodium and/or potassium. This pre-treatment takes place prior to, during or after forming the cathode but before use thereof. The entire carbon cathode, or only that part of the carbon which is nearest to the active cathode surface is treated, making it more resistant to penetration by components of the molten electrolyte of aluminium.

Suitable soap surfactants include the secondary soap surfactants which contain a carboxyl unit connected to a secondary carbon. Preferred secondary soap surfactants for use herein are water-soluble members selected from the group consisting of the water-soluble salts of 2-methyl-1-undecanoic acid, 2-ethyl-1-decanoic acid, 2-propyl-1-nonanoic acid, 2-butyl-1-octanoic acid and 2-pentyl-1-heptanoic acid. Certain soaps may also be included as suds suppressors.

#### Alkali metal sarcosinate surfactant

Other suitable anionic surfactants are the alkali metal sarcosinates of formula  $R-CON(R^1)CH_2COOM$ , wherein R is a  $C_5-C_{17}$  linear or branched alkyl or alkenyl group,  $R^1$  is a  $C_1-C_4$  alkyl group and M is an alkali metal ion. Preferred examples are the myristyl and oleoyl methyl sarcosinates in the form of their sodium salts.

#### Oxygen-releasing bleaching system

An optional component of the detergent composition is an oxygen-releasing bleaching system. In one preferred aspect the bleaching system contains a hydrogen peroxide source and an organic peroxyacid bleach precursor compound. The production of the organic peroxyacid occurs by an in situ reaction of the precursor with a source of hydrogen peroxide. Preferred sources of hydrogen peroxide include inorganic perhydrate bleaches. In an alternative preferred aspect a preformed organic peroxyacid is incorporated directly into the composition. Compositions containing mixtures of a hydrogen peroxide source and organic peroxyacid precursor in combination with a preformed organic peroxyacid are also envisaged.

#### Inorganic perhydrate bleaches

The compositions in accord with the invention preferably include a hydrogen peroxide source, as an oxygen-releasing bleach. Suitable hydrogen peroxide sources include the inorganic perhydrate salts.

The inorganic perhydrate salts are normally incorporated in the form of the sodium salt at a level of from 1 % to 40% by weight, more preferably from

4. 5,158,653, Oct. 27, 1992, Method for production of predetermined concentration graded alloys; David S. Lashmore, et al., 205/103; **204/192.12, 192.15, DIG.9**; 205/176; 427/255.7, 404, 405  
[IMAGE AVAILABLE]

US PAT NO: 5,158,653 [IMAGE AVAILABLE]

L19: 4 of 10

ABSTRACT:

A process for the production of a composition modulated alloy having a predetermined concentration is disclosed, in which alternating layers of at least two metals are successively deposited upon a substrate by electrodeposition, vacuum deposition, vapor deposition, or sputtering. The individual thicknesses of at least one metal's layers are varied in a predetermined manner. Pulsed galvanostatic electrodeposition using a tailored waveform is preferred. A copper-nickel concentration graded alloy is disclosed. Concentration graded alloys of predetermined concentration having at least one region of local homogeneity are also disclosed. The region of local homogeneity has a thickness corresponding to the thickness of two adjacent layers of different metals which have been diffusion annealed together. A pulsed electrodeposition/diffusion anneal process for production of such alloys is also disclosed. An electrochemical deposition method is also disclosed for the production of a non-layered, continuous concentration graded alloy.

5. 5,154,779, Oct. 13, 1992, Method of nitriding, carburizing, or oxidizing refractory metal articles using microwaves; Cressie E. Holcombe, et al., 148/207, 218, 220, 224, 241; **204/157.43**; 219/679, 686; 427/585, 590 [IMAGE AVAILABLE]

US PAT NO: 5,154,779 [IMAGE AVAILABLE]

L19: 5 of 10

ABSTRACT:

A method of nitriding an article of refractory-nitride-forming metal or metalloids. A consolidated metal or metalloid article is placed inside a microwave oven and nitrogen containing gas is introduced into the microwave oven. The metal or metalloid article is heated to a temperature sufficient to react the metal or metalloid with the nitrogen by applying a microwave energy within the microwave oven. The metal or metalloid article is maintained at that temperature for a period of time sufficient to convert the article of metal or metalloid to an article of refractory nitride. in ad

This invention was made with Government support under Contract No. DE-AC05-84OR21400 awarded by the U.S. Department of Energy to Martin Marietta Energy Systems, Inc. and the Government has certain rights in this invention.

6. 5,039,990, Aug. 13, 1991, Galvanically dissipatable evanescent chaff fiber; Ward C. Stevens, et al., 342/12; **204/DIG.6**; 428/601, 621, 671, 676 [IMAGE AVAILABLE]

US PAT NO: 5,039,990 [IMAGE AVAILABLE]

L19: 6 of 10

ABSTRACT:

An article comprising a non-conductive substrate having a sub-micron thickness of an oxidizable conductive first metal coating thereon, and a second (promoter) metal which is galvanically effective to promote the corrosion of the first metal, discontinuously coated on the first metal coating. Optionally, the second metal-doped, first metal-coated substrate may be further coated with a salt, to accelerate the galvanic corrosion reaction by which the conductive first metal coating is oxidized. Also disclosed is a related method of forming such articles, comprising chemical vapor depositing the first metal on the substrate and chemical vapor depositing the second metal on the applied first metal coating, and of optionally applying a salt by salt solution contacting of the second

Alkyl ethoxysulfate surfactants are preferably selected from the group consisting of the C<sub>10</sub>-C<sub>18</sub> alkyl sulfates which have been ethoxylated with from 0.5 to 20 moles of ethylene oxide per molecule. More preferably, the alkyl ethoxysulfate surfactant is a C<sub>11</sub>-C<sub>18</sub>, most preferably C<sub>11</sub>-C<sub>15</sub> alkyl sulfate which has been ethoxylated with from 0.5 to 7, preferably from 1 to 5, moles of ethylene oxide per molecule.

A particularly preferred aspect of the invention employs mixtures of the preferred alkyl sulfate and alkyl ethoxysulfate surfactants. Such mixtures have been disclosed in PCT Patent Application No. WO 93/18124.

#### Anionic sulfonate surfactant

Anionic sulfonate surfactants suitable for use herein include the salts of C<sub>5</sub>-C<sub>20</sub> linear alkylbenzene sulfonates, alkyl ester sulfonates, C<sub>6</sub>-C<sub>22</sub> primary or secondary alkane sulfonates, C<sub>6</sub>-C<sub>24</sub> olefin sulfonates, sulfonated polycarboxylic acids, alkyl glycerol sulfonates, fatty acyl glycerol sulfonates, fatty oleyl glycerol sulfonates, and any mixtures thereof.

#### Anionic carboxylate surfactant

Suitable anionic carboxylate surfactants include the alkyl ethoxy carboxylates, the alkyl polyethoxy polycarboxylate surfactants and the soaps ('alkyl carboxyls'), especially certain secondary soaps as described herein.

Suitable alkyl ethoxy carboxylates include those with the formula  $RO(CH_2CH_2O)_xCH_2COO-M^+$  wherein R is a C<sub>6</sub> to C<sub>18</sub> alkyl group, x ranges from 0 to 10, and the ethoxylate distribution is such that, on a weight basis, the amount of material where x is 0 is less than 20 % and M is a cation. Suitable alkyl polyethoxy polycarboxylate surfactants include those having the formula  $RO-(CHR_1-CHR_2-O)-R_3$  wherein R is a C<sub>6</sub> to C<sub>18</sub> alkyl group, x is from 1 to 25, R<sub>1</sub> and R<sub>2</sub> are selected from the group consisting of hydrogen, methyl acid radical, succinic acid radical, hydroxysuccinic acid radical, and mixtures thereof, and R<sub>3</sub> is selected from the group consisting of hydrogen, substituted or unsubstituted hydrocarbon having between 1 and 8 carbon atoms, and mixtures thereof.

metal-doped, first metal-coated substrate. When utilized in a form comprising fine-diameter substrate elements such as glass or ceramic filaments, the resulting product may be usefully employed as an evanescent chaff. In the presence of atmosphere moisture, such evanescent chaff undergoes oxidation of the first metal coating so that the radar signature of the chaff transiently decays.

7. 4,920,946, May 1, 1990, Blade cutting apparatus for hard brittle material; Akio Kuromatsu, 125/11.01, 16.01, 18; **204/224M**; 451/72, 165, 173, 540 [IMAGE AVAILABLE]

US PAT NO: 4,920,946 [IMAGE AVAILABLE]

L19: 7 of 10

ABSTRACT:

Apparatus is provided for effectively and precisely cutting metals, ceramics, composite materials and the like by use of a blade having an elongated metal band body and a conductive abrasive layer adhered to a cutting edge thereof, with an electrode disposed close to a side of the blade and a voltage difference is selectively applied continuously or intermittently between the electrode and the blade which is pressed against and reciprocated relative to the workpiece. A conductive processing fluid is supplied to a cutting portion between the blade and the workpiece and the processing voltage is continuously or intermittently applied to preferably provide a minus pole on the blade side and a plus pole on the work side. Electrolytic, electro-discharge and grinding operations are thus provided simultaneously, to thereby permit rapid and precise cutting of metals and other hard, brittle and difficult-to-cut materials while maintaining the cutting effectiveness of the blade. In one aspect of the invention, the blade is also provided with an insulation layer on at least a metal surface, and the cutting effects are thereby improved. In another aspect of the invention an ultrasonic input is provided at the cutting position to further increase the cutting efficiency of the apparatus.

8. 4,225,409, Sep. 30, 1980, Metallic modified material of intermetallic compound and a process for the production of the same; Shigeru Minomura, **204/192.25, 192.15** [IMAGE AVAILABLE]

US PAT NO: 4,225,409 [IMAGE AVAILABLE]

L19: 8 of 10

ABSTRACT:

The present invention is concerned with a new metallic modified material of intermetallic compound, which has the same chemical composition as an intermetallic compound semi-conductor with a zincblende-type or wurtzite-type crystalline structure and further has a rocksalt-type crystalline structure and which is stable at room temperature under atmospheric pressure to a high pressure.

9. 4,055,477, Oct. 25, 1977, Electrolyzing brine using an anode coated with an intermetallic compound; Harlan B. Johnson, 205/535; **204/219, 252** [IMAGE AVAILABLE]

US PAT NO: 4,055,477 [IMAGE AVAILABLE]

L19: 9 of 10

ABSTRACT:

Disclosed is an electrode having an electroconductive substrate and an electroconductive layer on the substrate. The electroconductive layer is an intermetallic compound of a platinum group metal and a transition metal. Also disclosed is a method of electrolyzing brine, such as sodium chloride brine, where the brine is fed to an electrolytic cell having an anode and a cathode, an electrical current is passed from the anode to the cathode, and chlorine is evolved at the anode, which anode has an electroconductive substrate with an electroconductive layer thereon formed by an intermetallic compound of a platinum group metal and a transition metal. The electroconductive layer may either be an

herein. The hydrophobic moiety of these products consists of the reaction product of ethylenediamine and excess propylene oxide, and generally has a molecular weight of from about 2500 to about 3000. Examples of this type of nonionic surfactant include certain of the commercially available Tetronic<sup>™</sup> compounds, marketed by BASF.

### Anionic surfactant

Essentially any anionic surfactants useful for deterative purposes are suitable. These can include salts (including, for example, sodium, potassium, ammonium, and substituted ammonium salts such as mono-, di- and triethanolamine salts) of the anionic sulfate, sulfonate, carboxylate and sarcosinate surfactants. Anionic sulfate surfactants are preferred.

Other anionic surfactants include the isethionates such as the acyl isethionates, N-acyl taurates, fatty acid amides of methyl tauride, alkyl succinates and sulfosuccinates, monoesters of sulfosuccinate (especially saturated and unsaturated C<sub>12</sub>-C<sub>18</sub> monoesters) diesters of sulfosuccinate (especially saturated and unsaturated C<sub>6</sub>-C<sub>14</sub> diesters), N-acyl sarcosinates. Resin acids and hydrogenated resin acids are also suitable, such as rosin, hydrogenated rosin, and resin acids and hydrogenated resin acids present in or derived from tallow oil.

### Anionic sulfate surfactant

Anionic sulfate surfactants suitable for use herein include the linear and branched primary and secondary alkyl sulfates, alkyl ethoxysulfates, fatty oleoyl glycerol sulfates, alkyl phenol ethylene oxide ether sulfates, the C<sub>5</sub>-C<sub>17</sub> acyl-N-(C<sub>1</sub>-C<sub>4</sub> alkyl) and -N-(C<sub>1</sub>-C<sub>2</sub> hydroxyalkyl) glucamine sulfates, and sulfates of alkylpolysaccharides such as the sulfates of alkylpolyglucoside (the nonionic nonsulfated compounds being described herein).

Alkyl sulfate surfactants are preferably selected from the linear and branched primary C<sub>10</sub>-C<sub>18</sub> alkyl sulfates, more preferably the C<sub>11</sub>-C<sub>15</sub> branched chain alkyl sulfates and the C<sub>12</sub>-C<sub>14</sub> linear chain alkyl sulfates.

intermediate layer with a further layer of a catalytic material, as an electrocatalytic material or surface catalytic material, or it may be the catalytic material itself.

10. 4,007,107, Feb. 8, 1977, Electrolytic anode; Harlan B. Johnson, 204/290F, 292, 293 [IMAGE AVAILABLE]

US PAT NO: 4,007,107 [IMAGE AVAILABLE]

L19: 10 of 10

ABSTRACT:

Disclosed is an electrode having an electroconductive substrate and an electroconductive layer on the substrate. The electroconductive layer is an intermetallic compound of a platinum group metal and a transition metal. Also disclosed is a method of electrolyzing brine, such as sodium chloride brine, where the brine is fed to an electrolytic cell having an anode and a cathode, an electrical current is passed from the anode to the cathode, and chlorine is evolved at the anode, which anode has an electroconductive substrate with an electroconductive layer thereon formed by an intermetallic compound of a platinum group metal and a transition metal. The electroconductive layer may either be an intermediate layer with a further layer of a catalytic material, as an electrocatalytic material or surface catalytic material, or it may be the catalytic material itself.

### Nonionic ethoxylated alcohol surfactant

The alkyl ethoxylate condensation products of aliphatic alcohols with from about 1 to about 25 moles of ethylene oxide are suitable for use herein. The alkyl chain of the aliphatic alcohol can either be straight or branched, primary or secondary, and generally contains from 6 to 22 carbon atoms. Particularly preferred are the condensation products of alcohols having an alkyl group containing from 8 to 20 carbon atoms with from about 2 to about 10 moles of ethylene oxide per mole of alcohol.

### Nonionic ethoxylated/propoxylated fatty alcohol surfactant

The ethoxylated C<sub>6</sub>-C<sub>18</sub> fatty alcohols and C<sub>6</sub>-C<sub>18</sub> mixed ethoxylated/propoxylated fatty alcohols are suitable surfactants for use herein, particularly where water soluble. Preferably the ethoxylated fatty alcohols are the C<sub>10</sub>-C<sub>18</sub> ethoxylated fatty alcohols with a degree of ethoxylation of from 3 to 50, most preferably these are the C<sub>12</sub>-C<sub>18</sub> ethoxylated fatty alcohols with a degree of ethoxylation from 3 to 40. Preferably the mixed ethoxylated/propoxylated fatty alcohols have an alkyl chain length of from 10 to 18 carbon atoms, a degree of ethoxylation of from 3 to 30 and a degree of propoxylation of from 1 to 10.

### Nonionic EO/PO condensates with propylene glycol

The condensation products of ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol are suitable for use herein. The hydrophobic portion of these compounds preferably has a molecular weight of from about 1500 to about 1800 and exhibits water insolubility. Examples of compounds of this type include certain of the commercially-available Pluronic<sup>TM</sup> surfactants, marketed by BASF.

### Nonionic EO condensation products with propylene oxide/ethylene diamine adducts

The condensation products of ethylene oxide with the product resulting from the reaction of propylene oxide and ethylenediamine are suitable for use



1. 5,846,396, Dec. 8, 1998, Liquid distribution system; Peter John Zanzucchi, et al., 204/601; 141/31; 204/451, 454; 417/50; 422/82, 103, 134 [IMAGE AVAILABLE]

US PAT NO: 5,846,396 [IMAGE AVAILABLE]

L23: 1 of 8

ABSTRACT:

The present invention provides a liquid distribution system, which is useful in a number of contexts, including in accomplishing various synthetic, diagnostic and drug screening reactions. The distribution system can comprise an alpha reservoir and a beta reservoir, a first set of parallel and adjacent first and second feeder channels and a second set of parallel and adjacent third and fourth feeder channels which are offset from the first and second feeder channels, wherein (a) the first and third feeder channels are connected to the alpha reservoir via a first connector channel that is situated above or below the second and fourth feeder channels and are independent of the beta reservoir and (b) the second and fourth feeder channels are connected to the beta reservoir via a second connector channel that is situated above or below the first and third feeder channels and are independent of the alpha reservoir. The distribution system is preferably a microscale distribution system. Various particular mechanisms for controlling flow into a liquid distribution system are described.

2. 5,719,033, Feb. 17, 1998, Thin film transistor bio/chemical sensor; Donald E. Ackley, et al., 435/7.92; 204/400, 402, 403, 422; 422/82.01, 82.02, 82.11, 98; 435/7.32, 7.95, 285.2; 436/524, 525, 527, 806 [IMAGE AVAILABLE]

US PAT NO: 5,719,033 [IMAGE AVAILABLE]

L23: 2 of 8

ABSTRACT:

A chemical sensor includes a thin film transistor with a gate positioned on one side. An insulating layer is positioned on the opposite side and an indicator film is positioned on the insulating layer in generally opposed relationship to the gate. Induced charge in the indicator film caused by a biological or chemical species changes the channel current in the transistor. A potential on the gate is then used to null out the resulting change in channel current. The potential used to null out the current change is an extremely sensitive measure of the induced charge.

3. 5,039,990, Aug. 13, 1991, Galvanically dissipatable evanescent chaff fiber; Ward C. Stevens, et al., 342/12; 204/DIG.6; 428/601, 621, 671, 676 [IMAGE AVAILABLE]

US PAT NO: 5,039,990 [IMAGE AVAILABLE]

L23: 3 of 8

ABSTRACT:

An article comprising a non-conductive substrate having a sub-micron thickness of an oxidizable conductive first metal coating thereon, and a second (promoter) metal which is galvanically effective to promote the corrosion of the first metal, discontinuously coated on the first metal coating. Optionally, the second metal-doped, first metal-coated substrate may be further coated with a salt, to accelerate the galvanic corrosion reaction by which the conductive first metal coating is oxidized. Also disclosed is a related method of forming such articles, comprising chemical vapor depositing the first metal on the substrate and chemical

### Optional Detergent Components

The detergent composition may optionally contain various components including surfactants, bleaching agents, alkalinity sources, water-soluble builder compounds, lime soap dispersants, organic polymeric compounds including polymeric dye transfer inhibiting agents, crystal growth inhibitors, heavy metal ion sequestrants, enzymes and enzyme stabilisers, corrosion inhibitors, suds suppressors, solvents, fabric softening agents, optical brighteners and hydrotropes.

### Surfactant

A highly preferred component of the compositions used in this invention is a surfactant system comprising surfactant selected from anionic, cationic, nonionic ampholytic and zwitterionic surfactants and mixtures thereof. Automatic dishwashing machine products should be low foaming in character and thus the foaming of the surfactant system must be suppressed or more preferably be low foaming, typically nonionic in character. The surfactant system is typically present at a level of from 0.2% to 30% by weight, more preferably from 0.5% to 10% by weight, most preferably from 1% to 5% by weight of the compositions.

A typical listing of anionic, nonionic, ampholytic and zwitterionic classes, and species of these surfactants, is given in U.S.P. 3,929,678 issued to Laughlin and Heuring on December, 30, 1975. A list of suitable cationic surfactants is given in U.S.P. 4,259,217 issued to Murphy on March 31, 1981. A listing of surfactants typically included in automatic dishwashing detergent compositions is given for example, in EP-A-0414 549 and PCT Applications Nos. WO 93/08876 and WO 93/08874.

### Nonionic surfactant

Essentially any nonionic surfactants useful for deterative purposes can be included in the compositions. Preferred, non-limiting classes of useful nonionic surfactants are listed below.

vapor depositing the second metal on the applied first metal coating, and of optionally applying a salt by salt solution contacting of the second metal-doped, first metal-coated substrate. When utilized in a form comprising fine-diameter substrate elements such as glass or ceramic filaments, the resulting product may be usefully employed as an evanescent chaff. In the presence of atmosphere moisture, such evanescent chaff undergoes oxidation of the first metal coating so that the radar signature of the chaff transiently decays.

4. 4,483,751, Nov. 20, 1984, Process of treating a nodic oxide film, printed wiring board and process of making the same; Seizo Murayama, et al., 205/201; 174/256; **204/507**; 205/229, 254; 427/96 [IMAGE AVAILABLE]

US PAT NO: 4,483,751 [IMAGE AVAILABLE]

L23: 4 of 8

ABSTRACT:

A process of treating an anodic oxide film wherein a base material of a valve metal is anodized to form the anodic oxide film thereon, which is then impregnated with a polymerizable organic metal compound and thereafter subjected to polymerization of the compound, whereby the micropores of the anodic oxide film are filled and sealed with the polymerized organometallic compound. According to this process, there is provided a base material having an anodic oxide film impregnated with polymerized organometallic compound which is excellent in heat resistance, heat radiance, and electrical insulation, and hence the base material is useful for the printed wiring board, electrically-insulative heat sink, heat-resistant insulated wire and the like.

5. 4,272,346, Jun. 9, 1981, Treatment of carbon fibers to decrease electrical hazards of conductive fiber fragment release; James J. Jakubowski, et al., 428/367; **204/489** [IMAGE AVAILABLE]

US PAT NO: 4,272,346 [IMAGE AVAILABLE]

L23: 5 of 8

ABSTRACT:

Carbon fibers are electrocoated by electrodeposition or electropolymerization to facilitate the formation of char, a nonconductive residue or fiber clumps when the coated fibers within a composite are subsequently exposed to fire. Coating materials or precursors are phosphorus compounds, titanates, polyimides, polyquinoxalines, nitriles, or boric acid.

6. 4,179,350, Dec. 18, 1979, Catalytically innate electrode(s); Gary A. Deborski, **204/284, 286, 292**; 252/512, 513 [IMAGE AVAILABLE]

US PAT NO: 4,179,350 [IMAGE AVAILABLE]

L23: 6 of 8

ABSTRACT:

An innate catalytically-active electrode, especially well suited for the electroreduction of oxygen in alkaline media, is comprised at least partially of a substantial proportion of a metal phthalocyanine in dry powder form compounded in intimate mixture with a finely comminuted, particulate metal all fabricated together in an integral porous body form of structure.

7. 3,895,954, Jul. 22, 1975, Epoxy resin photoresist with iodoform and bismuth triphenyl; Jerome Roteman, 430/280.1; **204/157.63, 157.69**; 430/914, 925 [IMAGE AVAILABLE]

US PAT NO: 3,895,954 [IMAGE AVAILABLE]

L23: 7 of 8

ABSTRACT:

Photopolymerizable compositions and processes for photopolymerizing such compositions are provided, said process comprising admixing with said

where  $R_1$ ,  $R_2$  and  $R_3$  are an alkyl group or substituted alkyl group of chain length C1 to C4, and  $n$  is 0 or 1.  $X$  is an organic substituent group, that is a substituent typically encountered in organic compounds, but excluding  $X$  being a hydrogen substituent.  $X$  can thus for example be an alkyl, aryl, alkenyl or alkaryl group optionally substituted by any functionality including for example, amino, hydroxyl, amide and ether functionalities.  $X$  may also be an organic functional group including for example an amine, hydroxyl, amide, ester or ether group.  $X$  is preferably an alkyl group, most preferably a methyl or ethyl group. ATCA is most preferably methyl glycine diacetic acid, that is where  $R_1 = R_2 = \text{a -CH}_2\text{-}$  group,  $n$  is 0 and  $X = \text{CH}_3$ .

ATCA can be present at levels of greater than 0.0001% by weight, preferably from 0.001 % to 40% by weight, most preferably from 0.1% to 15% by weight of the detergent composition.

ATCA acts as a cation complexing chelant. ATCA forms water-soluble chelates with calcium, magnesium, lead, copper, zinc, cadmium, mercury, manganese, iron, aluminium and other cationic polyvalent ions. The stability constant (measured as  $\log K_{\text{MeZ}}$ ) of ATCA-calcium chelate is greater than 5.0, preferably greater than 6.0. The stability constant of the preferred ATCA compound, methyl glycine diacetic acid (MGDA) is 7.0. The stability constant,  $\log K_{\text{MeZ}}$  is measured in a solution of ionic strength of 0.1, at a temperature of 25°C. The figure of  $>5.0$  for  $\log K_{\text{MeZ}}$  indicates that the ratio of the concentration of the undissociated  $[\text{CaATCA}^-]$  to the dissociated complex  $[\text{Ca}^{2+}][\text{ATCA}^{3-}]$ , is  $>10^5:1$

A preferred aspect of the present invention is a detergent composition wherein the weight ratio of builder system to ATCA is from 5:1 to 25:1, preferably 8:1 to 20:1, most preferably 10:1 to 15:1.

Another preferred aspect of the present invention is a detergent composition containing an organo diphosphonic acid crystal growth inhibitor component wherein the weight ratio of the organo diphosphonic acid to ATCA is from 1:2 to 1:20, preferably 1:2.5 to 1:8, most preferably 1:3 to 1:6.

epoxides, photosensitive organohalogen compounds in combination with an organometallic compound and thereafter applying energy to the resulting mixture. The organohalogens decompose to liberate an active catalyst which then serves to initiate polymerization of the epoxide **material**. The **organometallic** compound functions synergistically with the organohalogen to enhance the film forming properties of the resulting polymer and or sensitivity of the polymerizable system.

8. 3,880,743, Apr. 29, 1975, Process for preparing organometallic compounds; John L. Lang, **204/165, 164**; 260/665B, 665R; 556/1, 8, 27, 43, 46, 52, 53, 58, 70, 95, 98, 128, 129, 140, 143, 186, 188, 472; 568/8; 987/23 [IMAGE AVAILABLE]

US PAT NO: 3,880,743 [IMAGE AVAILABLE]

L23: 8 of 8

ABSTRACT:

Compounds having a metal-to-carbon bond are prepared by using an electric arc to comminute metal and thus produce as the comminution progresses, metal in a highly reactive, finely divided form, which is caused to react as it is formed with a suitable organic reagent to form the desired product. This makes it possible to avoid the expense, the difficulties, and the dangers of working with a substantial quantity of finely divided metal in the making of such compounds. Using the invention, compounds having a metal-to-carbon bond are made more directly and inexpensively than in accordance with the practices known prior to the instant invention, and in some instances, such compounds are obtained in good yield, wherein with practices known prior to the instant invention, they were obtained in low yield, if at all.

### Detailed Description of the Invention

The present invention relates to a detergent composition adapted for use in a cleaning method, exhibiting improved soil removal.

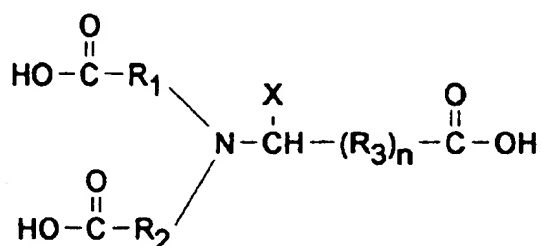
#### Builder system

The detergent composition described herein has as an essential component a builder system comprising a phosphate builder. The phosphate builder compound can be present at a level of from 1% to 80% by weight, preferably from 10% to 70% by weight, most preferably from 20% to 60% by weight of the detergent composition.

Specific examples of phosphate builder compounds include alkali metal tripolyphosphates, sodium, potassium and ammonium pyrophosphate, sodium and potassium and ammonium pyrophosphate, sodium and potassium orthophosphate, sodium polymeta/phosphate in which the degree of polymerisation ranges from about 6 to 21, and salts of phytic acid.

#### Amino Tricarboxylic Acid (ATCA)

The amino tricarboxylic acid (ATCA) is selected from the group having the general formula as shown below.



where  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are alkyl groups or substituted alkyl groups of chain length C1 to C4;  $n$  is 0 or 1; and  $\text{X}$  is an organic substituent group.

1. 5,811,236, Sep. 22, 1998, Electrochemiluminescent rhenium moieties and methods for their use; Richard J. Massey, et al., 435/6, 5, 7.1, 7.2, 7.9, 252.1; 436/500, 537, 548; 514/2; 530/387.2; 536/24.3, 45, 46, 49; 546/2 [IMAGE AVAILABLE]

US PAT NO: 5,811,236 [IMAGE AVAILABLE]

L11: 1 of 3

ABSTRACT:

Electrochemiluminiscent moieties having the formula

$[Re(P).sub.m (L.sup.1).sub.n (L.sup.2).sub.o (L.sup.3).sub.p (L.sup.4).sub.q (L.sup.5).sub.r (L.sup.6).sub.s ].sub.t (B).sub.u$   
wherein

P is a polydentate ligand of Re;

L<sup>1</sup>, L<sup>2</sup>, L<sup>3</sup>, L<sup>4</sup>, L<sup>5</sup> and L<sup>6</sup> are ligands of Re, each of which may be the same as or different from each other ligand;

B is a substance which is a ligand of Re or is conjugated to one or more of P, L<sup>1</sup>, L<sup>2</sup>, L<sup>3</sup>, L<sup>4</sup>, L<sup>5</sup> or L<sup>6</sup> ;

m is an integer equal to or greater than 1;

each of n, o, p, q, r and s is zero or an integer;

t is an integer equal to or greater than 1; and

u is an integer equal to or greater than 1;

P, L<sup>1</sup>, L<sup>2</sup>, L<sup>3</sup>, L<sup>4</sup>, L<sup>5</sup>, L<sup>6</sup> and B being of such composition and number that the chemical moiety can be induced to emit electromagnetic radiation and the total number of bonds to Re provided by the ligands of Re being equal to the coordination of Re are disclosed.

Qualitative and quantitative electrochemiluminescent assays for analytes of interest present in multicomponent liquids using these moieties are disclosed. These methods comprise contacting a sample with a reagent labeled with an electrochemiluminescent chemical moiety containing rhenium and capable of combining with the analyte of interest, exposing the resulting sample to chemical, electrochemical, or electromagnetic energy and detecting electromagnetic radiation emitted by the electrochemiluminescent chemical moiety.

2. 5,716,781, Feb. 10, 1998, Method of calibration of an electrochemiluminescent assay system; Richard J. Massey, et al., 435/6, 4, 5, 7.1, 7.2, 810; 436/63, 501; 536/24.3, 24.31, 24.32, 26.6 [IMAGE AVAILABLE]

US PAT NO: 5,716,781 [IMAGE AVAILABLE]

L11: 2 of 3

ABSTRACT:

Electrochemiluminiscent moieties having the formula

$[Re(P).sub.m (L.sup.1).sub.n (L.sup.2).sub.o (L.sup.3).sub.p (L.sup.4).sub.q (L.sup.5).sub.r (L.sup.6).sub.s ].sub.t (B).sub.u$   
wherein

P is a polydentate ligand of Re;

L<sup>1</sup>, L<sup>2</sup>, L<sup>3</sup>, L<sup>4</sup>, L<sup>5</sup> and L<sup>6</sup> are ligands of Re, each of which may be the same as or different from each other ligand;

B is a substance which is a ligand of Re or is conjugated to one or more of P, L<sup>1</sup>, L<sup>2</sup>, L<sup>3</sup>, L<sup>4</sup>, L<sup>5</sup> or L<sup>6</sup> ;

m is an integer equal to or greater than 1;

each of n, o, p, q, r and s is zero or an integer;

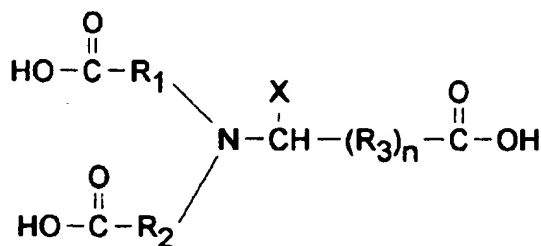
believed that said hard water ions attract negatively charged hydrophilic soils. Chemical interactions (calcium bridges) between the hard water ions and the hydrophilic soils make the soils harder to remove. Examples of hydrophilic soils include tea, coffee and red wine soils.

It has been found that the formation of insoluble white calcium phosphate complexes can be reduced by the addition of an amino tricarboxylic acid (ATCA) to the builder systems. It has also been found that enhanced removal of soils, particularly hydrophilic soils from the surface of dishware can also be achieved by the addition of an amino tricarboxylic acid (ATCA) to the builder systems. It is believed that ATCA chelates cations from the wash solution thus minimising their availability to form calcium bridges between the surface of the dishware and the hydrophilic soil.

### Summary of the Invention

According to the present invention there is provided a detergent composition comprising

- (a) a builder system comprising phosphate builder; and
- (b) an amino tricarboxylic acid or salt thereof wherein said amino tricarboxylic acid has the general formula:



where  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are alkyl groups or substituted alkyl groups of chain length C1 to C4;  $n$  is 0 or 1; and  $\text{X}$  is an organic substituent group.



t is an integer equal to or greater than 1; and  
u is an integer equal to or greater than 1;  
P, L.sup.1, L.sup.2, L.sup.3, L.sup.4, L.sup.5, L.sup.6 and B being of  
such composition and number that the chemical moiety can be induced to  
emit electromagnetic radiation and the total number of bonds to Re  
provided by the ligands of Re being equal to the coordination of Re  
are disclosed.

Qualitative and quantitative electrochemiluminescent assays for analytes  
of interest present in multicomponent liquids using these moieties are  
disclosed. These methods comprise contacting a sample with a reagent  
labeled with an electrochemiluminescent chemical moiety containing  
rhenium and capable of combining with the analyte of interest, exposing  
the resulting sample to chemical, electrochemical, or electromagnetic  
energy and detecting electromagnetic radiation emitted by the  
electrochemiluminescent chemical moiety.

3. 5,591,581, Jan. 7, 1997, Electrochemiluminescent rhenium moieties and  
methods for their use; Richard J. Massey, et al., 435/6, 5, 7.2, 235.1,  
325, 410; 436/537; 530/350, 400; 546/2; 556/45, 46, 49 [IMAGE AVAILABLE]

US PAT NO: 5,591,581 [IMAGE AVAILABLE]

L11: 3 of 3

#### ABSTRACT:

Electrochemiluminescent moieties having the formula

(Re(P).sub.m (L.sup.1).sub.n (L.sup.2).sub.o (L.sup.3).sub.p  
(L.sup.4).sub.t (B).sub.u

wherein

P is a polydentate ligand of Re;

L.sup.1, L.sup.2, L.sup.3 and L.sup.4 are ligands of Re, each of which  
may be the same as or not the same as each other ligand;

B is a substance which is a ligand of Re or is conjugated to one or more  
of P, L.sup.1, L.sup.2, L.sup.3 and L.sup.4 ;

m is an integer equal to or greater than 1;

each of n, o, p, q, r and s is zero or an integer;

t is an integer equal to or greater than 1; and

u is an integer equal to or greater than 1;

P, L.sup.1, L.sup.2, L.sup.3, L.sup.4 and B being of such composition  
and number that the chemical moiety can be induced to  
electrochemiluminesce and the total number of bonds to Re provided by  
the ligands of Re being equal to the coordination number of Re are  
disclosed.

Qualitative and quantitative electrochemiluminescent assays for analytes  
of interest present in multicomponent liquids using these moieties are  
also disclosed.

**MACHINE DISHWASHING COMPOSITION****Technical Field**

The present invention relates to a detergent composition adapted for use in a cleaning method exhibiting improved soil removal.

**Background to the Invention**

Compositions designed for use in cleaning, particularly in automatic dishwashing and laundry methods are well known and a consistent effort has been made by detergent manufacturers to improve the cleaning and/or rinsing efficiency of said compositions as reflected by many patent publications.

Builder components are traditionally added to detergent compositions to chelate cations ( $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$ ) that are the cause of water hardness. Water hardness ions that are not chelated may form insoluble complexes with anionic species or form inorganic white phosphate, carbonate or silicate deposits on the articles in the wash that are unacceptable to the consumer.

A further problem believed to result from the presence of water hardness ions in the solution relates to the removal of hydrophilic soils from soiled dishware. It is believed that water hardness ions adhere to the surface of dishware by way of ionic attractions between the negatively charged groups of the dishware and the positively charged hard water ions. It is further

1. 5,843,287, Dec. 1, 1998, Method for recovering metals from waste; George G. Wicks, et al., 204/157.15, 157.43; 219/678; 588/252, 256 [IMAGE AVAILABLE]

US PAT NO: 5,843,287 [IMAGE AVAILABLE]

L26: 1 of 22

ABSTRACT:

A method for recovering metals from metals-containing wastes, and vitrifying the remainder of the wastes for disposal. Metals-containing wastes such as circuit boards, cathode ray tubes, vacuum tubes, transistors and so forth, are broken up and placed in a suitable container. The container is heated by microwaves to a first temperature in the range of approximately 300.degree.-800.degree. C. to combust **organic materials** in the waste, then heated further to a second temperature in the range of approximately 1,000.degree.-1,550.degree. C. at which temperature glass formers present in the waste will cause it to melt and vitrify. Low-melting-point metals such as tin and aluminum can be recovered after organics combustion is substantially complete. Metals with higher melting points, such as gold, silver and copper, can be recovered from the solidified product or separated from the waste at their respective melting points. Network former-containing materials can be added at the start of the process to assist vitrification.

2. 5,766,789, Jun. 16, 1998, Electrical energy devices; David James, et al., 429/44; 204/431; 429/232 [IMAGE AVAILABLE]

US PAT NO: 5,766,789 [IMAGE AVAILABLE]

L26: 2 of 22

ABSTRACT:

The performance of electrochemical energy devices such as batteries, fuel cells, capacitors and sensors is enhanced by the use of electrically conducting **ceramic materials** in the form of fibers, powder, chips and substrates.

3. 5,720,869, Feb. 24, 1998, Equipment and process for producing high-purity water; Koji Yamanaka, et al., 205/701; 204/263, 264, 275; 205/742, 746, 748 [IMAGE AVAILABLE]

US PAT NO: 5,720,869 [IMAGE AVAILABLE]

L26: 3 of 22

ABSTRACT:

A high-purity water producing equipment comprises a primary purification treatment system, a primary deionized water tank, a secondary purification treatment system for producing high-purity water from a primary deionized water, a circulatory system pipe for returning the produced high-purity water to a primary deionized water tank and a branch water feed system branched off from the circulatory system for feeding the high-purity water to a use point. An electrolytic unit for producing the anolyte EIW (electrolytic ionized water) to be catholyte EIW from the electrolysis of the high-purity water is provided as a bypass midway along the circulatory system. The anolyte EIW is added to the circulatory pipe downstream of the branching point toward the use point, when cleaning of units is necessary.

4. 5,637,199, Jun. 10, 1997, Sputtering shields and method of manufacture; Robert D. Lorentz, et al., 204/192.1, 298.11; 264/86; 427/372.2 [IMAGE AVAILABLE]

# (12) UK Patent Application (19) GB (11) 2 311 538 (13) A

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(22) Date of Filing 29.03.1996

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(51) INT CL<sup>6</sup>  
**C11D 3/33**

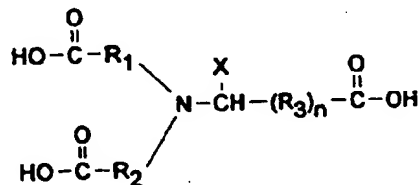
(52) UK CL (Edition O )  
**C5D DEX DHE D102 D107 D108 D109 D110 D111 D112  
D116 D117 D120 D121 D125 D126 D127 D129 D133  
D145 D147 D149 D152 D153 D154 D155 D162 D166  
D171 D173 D180 D183**

(56) Documents Cited  
**WO 94/29421 A1 US 4997587 A**

(58) Field of Search  
**UK CL (Edition O ) C5D DEX DHE DHZ  
INT CL<sup>6</sup> C11D 3/33  
Online: WPI, Claims, Japio, CAS online**

## (54) Detergent compositions

(57) Detergent compositions comprise a builder system comprising a phosphate builder and an amino tricarboxylic acid or its salts. The tricarboxy acid has formula:-



where  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are alkyl groups or substituted alkyl groups of chain length C1 to C4; n is 0 or 1; and X is an organic substituent group.

Preferably X is  $-\text{CH}_3$ ;  $\text{R}_1$  and  $\text{R}_2$  are  $-\text{CH}_2$ , n is 0 and the acid is methylglycine diacetic acid. Utility is in dishwashing and laundry.

GB 2 311 538 A

## ABSTRACT:

Coated shields useful in a sputtering deposition chamber comprise a binder and particles of the same material as the target. Application of the coating material to interior surfaces and appliances of the sputtering chamber reduces contamination of the sputtered material.

5. 5,616,221, Apr. 1, 1997, Electrolytic ionized water producing apparatus; Hidemitsu Aoki, et al., 204/252, 263, 628, 632; 205/743, 746, 748 [IMAGE AVAILABLE]

US PAT NO: 5,616,221 [IMAGE AVAILABLE]

L26: 5 of 22

## ABSTRACT:

An electrolytic ionized water (EIW) producing apparatus comprises an anode, a cathode, an electrolyzer which includes an anode chamber, a cathode chamber and an intermediate chamber, inlet lines for supplying an influent water to the three chambers, and outlet lines for discharging effluent water from the chambers. Further, an acidic electrolyte supplying unit is connected to the outlet line from the anode chamber, and an alkaline electrolyte supplying unit is connected to the outlet line from the cathode chamber. The electrolyte supplying units can selectively control at least the dosage level of electrolyte(s) to be supplied, the composition and concentration of the electrolyte(s) or pH of EIW after the addition of the electrolyte(s).

6. 5,593,554, Jan. 14, 1997, Electrolytic ionized water producing apparatus; Koji Yamanaka, et al., 204/252, 263, 275, 628, 632 [IMAGE AVAILABLE]

US PAT NO: 5,593,554 [IMAGE AVAILABLE]

L26: 6 of 22

## ABSTRACT:

In an electrolytic ionized water (EIW) producing apparatus, a three-chamber electrolyzer includes an anode chamber, a cathode chamber and an intermediate chamber. An influent such as deionized water is supplied to these chamber via inlet lines. Further an electrolyte supplying units are connected to the inlet lines of the anode chamber and the inlet line of the cathode chamber.

7. 5,527,442, Jun. 18, 1996, Refractory protective coated electrolytic cell components; Jainagesh A. Sekhar, et al., 204/247.3, 247, 290R, 293, 294; 428/614, 627, 633, 641, 660, 661, 662, 663, 667 [IMAGE AVAILABLE]

US PAT NO: 5,527,442 [IMAGE AVAILABLE]

L26: 7 of 22

## ABSTRACT:

A carbonaceous, refractory or **metal alloy** substrate material coated with a refractory material, the refractory material including at least one of borides, silicides, nitrides, aluminides, carbides, phosphides, oxides, **metal alloys**, inter-metallic compounds and mixtures of one of titanium, chromium, zirconium, hafnium, vanadium, silicon, niobium, tantalum, nickel, molybdenum and iron and at least one refractory oxide of rare earth metals. An aluminum production cell including a component made up of a material coated with the coating described above is also disclosed.

8. 5,447,291, Sep. 5, 1995, Processes for fabricating structural ceramic bodies and structural ceramic-bearing composite bodies; Kenneth H. Sandhage, 148/516, 284, 285, 286, 523, 538, 539; 156/89.28; 204/192.15; 264/332; 419/19; 427/250, 372.2, 376.3, 383.5, 455, 526, 556, 576 [IMAGE AVAILABLE]

-continued

( D ) TOPOLOGY: linear

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:10:

CACTGCCGTC TGGATTCCCC

20

( 2 ) INFORMATION FOR SEQ ID NO:11:

( i ) SEQUENCE CHARACTERISTICS:

- ( A ) LENGTH: 19 base pairs
- ( B ) TYPE: nucleic acid
- ( C ) STRANDEDNESS: single
- ( D ) TOPOLOGY: linear

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:11:

GGGAATCCA G ACGGCAGTG

19

( 2 ) INFORMATION FOR SEQ ID NO:12:

( i ) SEQUENCE CHARACTERISTICS:

- ( A ) LENGTH: 27 base pairs
- ( B ) TYPE: nucleic acid
- ( C ) STRANDEDNESS: single
- ( D ) TOPOLOGY: linear

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:12:

GAATTCAATC AAAAAGGGAC GTTTCGG

27

( 2 ) INFORMATION FOR SEQ ID NO:13:

( i ) SEQUENCE CHARACTERISTICS:

- ( A ) LENGTH: 25 base pairs
- ( B ) TYPE: nucleic acid
- ( C ) STRANDEDNESS: single
- ( D ) TOPOLOGY: linear

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:13:

CCGTCCCTTT TTGATTGAAT TCACC

25

( 2 ) INFORMATION FOR SEQ ID NO:14:

( i ) SEQUENCE CHARACTERISTICS:

- ( A ) LENGTH: 27 base pairs
- ( B ) TYPE: nucleic acid
- ( C ) STRANDEDNESS: single
- ( D ) TOPOLOGY: linear

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:14:

CGGCATACGT CAAATAATCA TAGTTGC

27

( 2 ) INFORMATION FOR SEQ ID NO:15:

( i ) SEQUENCE CHARACTERISTICS:

- ( A ) LENGTH: 43 base pairs
- ( B ) TYPE: nucleic acid
- ( C ) STRANDEDNESS: single
- ( D ) TOPOLOGY: linear

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:15:

GOTACTATCG TAACAATGOC CGATTGCTGA CGCTOTTATT TGC

43

( 2 ) INFORMATION FOR SEQ ID NO:16:

( i ) SEQUENCE CHARACTERISTICS:

- ( A ) LENGTH: 40 base pairs
- ( B ) TYPE: nucleic acid
- ( C ) STRANDEDNESS: single
- ( D ) TOPOLOGY: linear

## ABSTRACT:

Shaped refractory ceramic and refractory ceramic composite objects are made from corresponding shaped, oxidation-resistant-metal-bearing objects through exposure to an oxidizing environment without substantial changes in dimensions by providing in the shaped metal-bearing objects a combination of a) metals which when oxidized form a ceramic compound with a larger molar volume than the molar volume of the metals consumed to make the ceramic compound with b) metals which when oxidized form a ceramic compound with a smaller molar volume than the molar volume of the metals consumed to make the ceramic compound. Metal-bearing objects, containing metals such as silicon or aluminum, which when oxidized form ceramic or ceramic-composite objects containing refractory ceramic compounds of desired properties, such as compounds containing silicon oxide or aluminum oxide, for which the ceramic compounds have a molar volume that is greater than the molar volumes of the metals consumed to make the ceramic compounds, expand upon oxidation, thereby having an adverse effect on the properties of the resulting ceramic and preventing the maintenance of the dimensions of the metal-bearing objects. The present invention is the discovery that when alkali or alkaline earth metals, which when oxidized have molar volumes that are less than such metals, are alloyed with or otherwise combined with oxidation-resistant metals that are formed into the metal-bearing objects and converted into desired refractory ceramics, swelling, resulting loss of mechanical properties, and dimensional changes are reduced or eliminated. Further, such combination of a) metals that after oxidation form ceramic compounds having a molar volume greater than the molar volumes of the metals consumed to make the ceramic compound with b) alkali or alkaline earth metals that after oxidation form ceramic compounds having a molar volume less than the molar volume of the alkali or alkaline earth metals consumed to make the ceramic compounds provides an unexpectedly advantageous brazing alloy for joining ceramic-bearing bodies.

9. 5,411,592, May 2, 1995, Apparatus for deposition of thin-film, solid state batteries; Stanford R. Ovshinsky, et al., 118/718, 50, 314, 325, 719; 204/298.25, 298.26; 429/127, 162 [IMAGE AVAILABLE]

US PAT NO: 5,411,592 [IMAGE AVAILABLE]

L26: 9 of 22

## ABSTRACT:

A multi-chambered deposition apparatus for depositing solid-state, thin-film battery materials onto substrate material. The apparatus minimally includes at least three distinct evacuable deposition chambers, which are physically interconnected in series. The first deposition chamber is adapted to deposit a layer of battery electrode material having a first polarity onto the substrate. The second deposition chamber is adapted to deposit a layer of solid-state electrolyte material onto the layer of battery electrode material deposited in the first chamber. The third deposition chamber is adapted to deposit a layer of battery electrode material having an opposite polarity from that deposited in the first chamber onto the solid-state electrolyte. The deposition chambers are interconnected by gas gates such that the substrate material is allowed to proceed from one deposition chamber to the next, while maintaining gaseous segregation between the chambers.

10. 5,310,476, May 10, 1994, Application of refractory protective coatings, particularly on the surface of electrolytic cell components; Jainagesh Sekhar, et al., 205/230; 204/290R, 294; 427/212, 215, 216, 224, 372.2, 397.7, 533, 543, 545, 554, 557, 576, 594, 596 [IMAGE AVAILABLE]

US PAT NO: 5,310,476 [IMAGE AVAILABLE]

L26: 10 of 22

## ABSTRACT:

-continued

225	230					235					240				
Pro Tyr Gln Asn Val Met Asp Gly Val Leu Asn Tyr Pro Ile Tyr Tyr	245					250					255				
Pro Leu Leu Asn Ala Phe Lys Ser Thr Ser Gly Ser Met Asp Asp Leu	260					265					270				
Tyr Asn Met Ile Asn Thr Val Lys Ser Asp Cys Pro Asp Ser Thr Leu	275					280					285				
Leu Gly Thr Phe Val Glu Asn His Asp Asn Pro Arg Phe Ala Ser Tyr	290					295					300				
Thr Asn Asp Ile Ala Leu Ala Lys Asn Val Ala Ala Phe Ile Ile Leu	305					310					315				
Asn Asp Gly Ile Pro Ile Ile Tyr Ala Gly Gln Glu Gln His Tyr Ala	325					330					335				
Gly Gly Asn Asp Pro Ala Asn Arg Glu Ala Thr Trp Leu Ser Gly Tyr	340					345					350				
Pro Thr Asp Ser Glu Leu Tyr Lys Leu Ile Ala Ser Ala Asn Ala Ile	355					360					365				
Arg Asn Tyr Ala Ile Ser Lys Asp Thr Gly Phe Val Thr Tyr Lys Asn	370					375					380				
Trp Pro Ile Tyr Lys Asp Asp Ile Thr Ile Ala Met Arg Lys Gly Thr	385					390					395				
Asp Gly Ser Glu Ile Val Thr Ile Leu Ser Asn Lys Gly Ala Ser Gly	405					410					415				
Asp Ser Tyr Thr Leu Ser Leu Ser Gly Ala Gly Tyr Thr Ala Gly Glu	420					425					430				
Gln Leu Thr Glu Val Ile Gly Cys Thr Thr Val Thr Val Gly Ser Asp	435					440					445				
Gly Asn Val Pro Val Pro Met Ala Gly Gly Leu Pro Arg Val Leu Tyr	450					455					460				
Pro Thr Glu Lys Leu Ala Gly Ser Lys Ile Cys Ser Ser Ser	465					470					475				

## (2) INFORMATION FOR SEQ ID NO:8:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (x1) SEQUENCE DESCRIPTION: SEQ ID NO:8:

CACTTCAACG CACCTTTCAG C

21

## (2) INFORMATION FOR SEQ ID NO:9:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (x1) SEQUENCE DESCRIPTION: SEQ ID NO:9:

CATGGACTTC ATTACTGGG

20

## (2) INFORMATION FOR SEQ ID NO:10:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single